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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/711,649	09/29/2004	Kohei Kawamura	SSIT-114	5648

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EXAMINER

HARRISON, MONICA D

ART UNIT	PAPER NUMBER
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2813

DATE MAILED: 10/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/711,649

Applicant(s)

KAWAMURA ET AL.

Examiner

Monica D. Harrison

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 June 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,5-15 and 17-26 is/are pending in the application.
- 4a) Of the above claim(s) 3,4 and 16 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,5-15 and 17-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 4/7/06
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. Applicant's amendment filed 6/7/06 has been entered. Examiner acknowledges claims 3, 4 and 16 have been cancelled.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 2, 5, 7-9, 12, 14, 15, 17, 18, 20- 22 and 25 are rejected under 35 U.S.C. 102(e) as being anticipated by Reid et al (6,958,123 B2).

2. Regarding claim 1, Reid et al discloses a method of processing a dielectric film, the method comprising: providing a substrate (Figure 1A, reference 10) having a fluoro-carbon dielectric film deposited thereon, the film having an exposed surface containing contaminants (Figure 1B, reference 14); and treating the exposed surface with a supercritical carbon dioxide fluid to clean the exposed surface of the contaminants and provide surface termination (column 6, lines 5-17), wherein the supercritical carbon dioxide fluid further comprises a solvent, and wherein the solvent comprises an alcohol or a silicon-containing chemical, or a combination thereof (column 15, lines 23-43).

3. Regarding claim 2, Reid et al discloses wherein the contaminants comprise CH_x, H₂O, OH, or HF, or a combination of two or more thereof (column 4, lines 23-32).

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4. Regarding claim 5, Reid et al discloses wherein the alcohol comprises methanol, ethanol, propanol, or butanol, or a combination of two or more thereof (column 14, lines 33-56).

5. Regarding claim 7, Reid et al discloses wherein the surface termination comprises C-F functional groups or Si-Me₃ functional groups (column 4, lines 23-32).

6. Regarding claim 8, Reid et al discloses wherein the treating comprises: performing a first treatment wherein the supercritical carbon dioxide fluid contains the alcohol solvent (column 15, lines 49-67 thru column 16, lines 1-5); and performing a second treatment wherein the supercritical carbon dioxide fluid contains a the silicon-containing chemical solvent (column 16, lines 33-56).

7. Regarding claim 9, Reid et al discloses wherein the alcohol comprises methanol, ethanol, propanol, or butanol, or a combination of two or more thereof (column 14, lines 33-56).

8. Regarding claim 12, Reid et al discloses further comprising: depositing a metal-containing film onto the treated surface of the fluorocarbon film, wherein the surface termination improves adhesion of the metal-containing film to the fluorocarbon film (Figure 1D, reference 22).

9. Regarding claim 14, Reid et al discloses a method of processing a dielectric film, the method comprising: providing a substrate (Figure 1A, reference 10) having a patterned fluorocarbon dielectric film formed thereon (Figure 1B, reference 14), the patterned fluorocarbon dielectric film having one or more vias or trenches (Figure 1B, references 16A and 16B), or a combination thereof, and the patterned fluorocarbon dielectric film having an exposed surface containing contaminants (Figure 1B, reference 14); and treating the exposed surface with

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a supercritical carbon dioxide fluid and a solvent to clean the exposed surface of the contaminants and provide surface termination (column 15, lines 23-43).

10. Regarding claim 15, Reid et al discloses wherein the contaminants comprise CH_x , H_2O , OH , or HF , or a combination of two or more thereof (column 4, lines 23-32).

11. Regarding claim 17, Reid et al discloses wherein the solvent comprises an alcohol or a silicon-containing chemical, or a combination thereof (column 6, lines 5-28).

12. Regarding claim 18, Reid et al discloses wherein the alcohol comprises methanol, ethanol, propanol, or butanol, or a combination of two or more thereof (column 14, lines 33-56).

13. Regarding claim 20, Reid et al discloses wherein the surface termination comprises C-F functional groups or Si-Me_3 functional groups (column 4, lines 23-32).

14. Regarding claim 21, Reid et al discloses wherein the treating comprises: performing a first treatment wherein the supercritical carbon dioxide fluid contains an alcohol as the solvent (column 15, lines 49-67 thru column 16, lines 1-5); and performing a second treatment wherein the supercritical carbon dioxide fluid contains a silicon-containing chemical as the solvent (column 16, lines 55-60).

15. Regarding claim 22, Reid et al discloses wherein the alcohol comprises methanol, ethanol, propanol, or butanol, or a combination of two or more thereof (column 14, lines 33-56).

16. Regarding claim 25, Reid et al discloses further comprising: depositing a metal-containing film onto the treated surface of the fluorocarbon film, wherein the surface termination improves adhesion of the metal-containing film to the fluorocarbon film (Figure 1D, reference 22).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 6, 10, 11, 19, 23 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reid et al (6,958,123 B2) in view of Bhanap et al (2005/0095840 A1).

17. Reid et al discloses all above claimed subject matter except the silicon containing chemicals (claims 6, 10, 19 and 23) and the nitrated fluorocarbon film (claims 11 and 24).

Bhanap et al discloses the silicon containing chemicals (pg.3, paragraph 0027) and the nitrated fluorocarbon film (pp.4-5, paragraph 0036).

It is obvious, at the time the invention was made, for one having ordinary skill in the art, to modify Reid et al, with the teachings of Bhanap et al, for the purpose of using many different silanes and other materials because for their ability to provide anti-stiction for MEMS structures.

Claims 13 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reid et al (6,958,123 B2) in view of Sieber et al (2005/0176230 A1).

18. Reid et al discloses a metal containing film (Figure 1D, reference 22) however, Reid et al does not disclose wherein the metal-containing film comprises tantalum (claims 13 and 26).

Sieber et al discloses wherein the metal-containing film comprises tantalum (pg.3, paragraph 0035).

It is obvious, at the time the invention was made, for one having ordinary skill in the art, to modify Reid et al with the teachings of Sieber et al, for the purpose of using tantalum and well as other metals to serve as a passivation layer in a MEMS structure.

Response to Arguments

19. Applicant's arguments with respect to claims 1-26 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

20. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Monica D. Harrison whose telephone number is 571-272-1959. The examiner can normally be reached on M-F 7:00am-3:30pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead Jr. can be reached on 571-272-1702. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Monica D. Harrison
AU 2813

mdh
October 24, 2006


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